

REMARKS:

By the above amendment, Applicant has rewritten all claims to define the invention more particularly and distinctly, and to overcome the rejections and define the invention over the prior art.

The Rejection of Claims 7-10 Under 35 U.S.C. & 112 to Overcome

The claims were rejected because of the lack of antecedent basis. Claims 7-10 were rewritten as claims 17-20 with the addition of “e) a microcontroller mounted in said switch housing; and.”

The Rejections of Claims 1-10 as being anticipated by Bensoussan et al.(U.S. Patent 5,025,134) Are Overcome

Bensoussan teaches us the use of a microcontroller but derives his DC power from multiple AC cycles: “electronic switch to open for a whole number of power supply cycles from said first power supply so that said means for storing electrical energy of said second power supply is charged from said first power supply”(column 7, lines 45-50).

In the Applicant's invention, the DC power is derived from a portion of the phase of each individual AC cycle noted as "cycle-stealing". Bensoussan teaches against using such a method:

"The method used in the above mentioned patents comprises a step of interrupting the supply of the load during a certain portion of the phase of the alternating half-cycle. It is the level of a voltage threshold value or of a predetermined angle that determines the phase at which the supply is ended, and at which the supply of the load is triggered.

This method has several drawbacks that limit its practical realization. The interruptions of power supply produce many transients on the line, and emit electromagnetic interference. The interference or the transients are important in so far as the ohmic value of the load is low. Moreover, the current used to supply the controller is dependent upon the ohmic value of the load and consequently, the energy available for the controller depends on the impedance of the load.

Another drawback results from the fact that the commutation phase of each half-cycle being relatively low, the energy accumulated for supplying the controller is limited to a low value which limits the consumption, and therefore the applications of the controller."

These are the deficiencies of prior art for deriving DC power from AC cycle that this invention has overcome. There is no dependencies on the ohmic value of the load and there is sufficient power to the controller because the present invention does not supply power to the load until a predetermined minimum voltage level is obtained. This predetermined minimum level allows for significant power to be supplied to the controller circuitry prior to enabling the thyristor. Unlike prior art, the DC power supply is not dependent on the threshold level of the semiconductor device such as the gate voltage of a triac. The transients and interference are reduced by supplying voltage to the load at or near the zero crossings.

The claims were rewritten to point out this distinction, and expressly recite that the claimed invention derives the DC power from the every AC half cycle or full cycle.

Furthermore, as will be discussed below, the claims include limitations that also distinguish over then prior methods (as in Weber) that have employed interruption of the supply load during portion of the AC cycle.

The Rejections of Claims 1-10 as being anticipated by Pearlman et al. (U.S. Patent 4,649,323) Are Overcome

Pearlman teaches using a microcontroller to dim lights using multiple switches and re-programmability, but he derives DC power from both leads of the AC power lines and supplies the load in parallel with his device. In majority of homes, the switches are wired in a one-sided configuration with the load in series with the switch.

The Applicant's invention addresses the one-sided configuration. The claims were rewritten to point out this distinction, by expressly stating that the functions are within the single lead.

The Rejections of Claims 1-10 as being anticipated by Simmons (U.S. Patent 5,481,452) Are Overcome

Simmons teaches the use of a microcontroller, but the Simmons' invention derives power from a parallel connection to the AC power lines as shown in Figure 4 of U.S. Patent 5,481,452 or Simmons' invention uses a battery 6 shown in Figure 3 of the '452 when attached to a one-sided configuration.

The Applicant's invention addresses the one-sided configuration that uses no battery. The claims were rewritten to point out this distinction, by expressly stating that the power is derived from the single lead..

The Rejections of Claims 1-10 as being anticipated by Weber (U.S. Patent 5,481,452) Are Overcome

Weber teaches a two-terminal device but uses a large capacitor to store DC power on the off cycles. Weber therefore exhibits deficiencies described by Bensoussan with reference to the prior art, in that the variability of the power supply is based on the threshold of the thyristor. Furthermore, Weber teaches turning the thyristor OFF by shunting the gate current away from the thyristor gate.

Applicant's claimed invention is distinct from Weber in that, rather than shunting the gate current, it alternately provides for a gate current pulse to turn the thyristor ON, or it does not provide this gate current pulse and therefore the thyristor remains OFF. Because of this, the claimed invention can enable the thyristor in an ON state any given phase of the AC cycle. This provides a very flexible control over the load. For example, one can dim the light to any level, unlike the method that is shown in Weber teaches. Also, with the same circuitry, many different control schemes can be configured. The claims were rewritten to point out this distinction, of expressly require enabling or disabling the thyristor by providing or not providing this gate current pulse.

The Distinction of the claimed Invention over Rothenbuhler (U.S. Patent 5,955,847)

Rothenbuhler teaches dimming a fluorescent lamp by applying a high voltage pulse rather than the operating voltage to the fluorescent lamp at certain times. Rothenbuhler's circuitry provides for this high voltage pulse by opening or closing the circuit to the coil in

series with the load. This is completely different from the Applicant's claimed invention, which controls the applied voltage or current to the load, and does not increase the applied voltage above the stated operating AC voltage.

In addition, Rothenbuhler derives DC power from AC power similar to Weber except for the high voltage, high current bridge diode circuit. The capacitor is charged during the times when the circuit is not energized. In fact at or near zero crossing is when the capacitor is being discharged. In the Applicant's invention, the power is derived at zero crossing to a predetermined level.

CONCLUSION

For the above reasons, the applicant submits that the claims are now in proper form, and that the claims all define patentably over the prior art. The combination of prior art does not lead one to the claimed invention because none of the prior art teaches the unique "cycle stealing and control" method. Therefore, the applicant submits that this application is now in condition for allowance.

Respectfully submitted,

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